

REMARKS

Claims 1-4, 6-7, and 10 are pending in the present application. Claim 2 has been canceled, and no claims have been added, leaving Claims 1, 3-4, 6-7, and 10 for further consideration in the present amendment.

Claim 1 has been amended to include the limitation that the semiconductor material surface is a collar region or a surface of a trench. Support for this limitation can at least be found in paragraph (para.) 25 of the specification as originally filed. Specifically, para. 25 describes removing arsenic ions from the collar region of a trench capacitor and also from the surfaces of a shallow trench isolation region (STI). Accordingly, no new matter has been introduced by this amendment.

Reconsideration and allowance of the claims is respectfully requested in view of the following remarks.

Claim Rejections Under 35 U.S.C. § 112

Claims 1-4, 6-7, and 10 have been rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement. In particular, the Examiner believes that the original disclosure fails to support the previous amendment to the claims, which added the limitation of conducting the coating step without first diffusing the dopant ions or sputtering the dopant ions. Applicants have amended the claims to remove this limitation, thus rendering this rejection of the claims moot.

In view of the foregoing, Applicants respectfully request the withdrawal of the 35 U.S.C. §112 rejection.

Claim Rejections Under 35 U.S.C. § 103

Claims 1 and 3-4, 6-7, and 10 stand rejected under 35 U.S.C. § 103(a), as allegedly being unpatentable over the state of the prior art admitted by the Applicants in view of any one of U.S. Patent No. 6,489,616 to Giedd (hereinafter "Giedd") and U.S. Patent No. 4,144,634 to

Chang *et al.* (hereinafter referred to as "Chang"). Applicants respectfully traverse these rejections.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). It has long been recognized that establishing a *prima facie* case of obviousness requires that all elements of the invention be disclosed in the prior art. *In re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970). In *KSR International Co. v. Teleflex Inc.*, the Supreme Court also found that it remains legally insufficient to conclude that a claim is obvious "merely by demonstrating that each element was, independently, known in the prior art." *KSR*, 127 S. Ct. at 1731. Independent Claim 1 has been amended to indicate that the semiconductor material surface from which the dopant ions are removed is a collar region or a surface of a trench. The cited art, whether taken individually or in combination, fails to teach or suggest removing implanted dopant ions from a collar region or a surface of a trench.

Turning now to the cited references, Giedd in no way suggests removing dopant ions that have been implanted into a collar region or surface of a trench such as a trench capacitor or an STI. In contrast, Giedd describes removing dopant ions from below the surface of an infrared sensor having an amorphous surface layer containing organic carbon and a high dopant concentration (see, e.g., Giedd - col. 5, lines 35-48; FIG. 1; and col. 16, the 1st para.). Moreover, Chang fails to remedy this deficiency of Giedd, for Chang describes cleaning the surface of an epitaxially grown GaAs substrate rather than a collar region or surface of a trench. Furthermore, the surface being cleaned in Chang does not include implanted dopants but instead includes epitaxially grown dopants. See, e.g., Chang - col. 5, lines 41-44.

Additionally, Applicants have failed to admit that treating a collar region or a surface of a trench to remove implanted dopant ions was known in the art at the time of the invention. On the contrary, paragraph 13 of the specification indicates that conventional cleaning methods generally modify the wafer surface to remove contaminants and are not effective for removing dopant ions.

In view of the foregoing, independent Claim 1 and dependent Claims 3-4, 6-7, and 10, which depend therefrom, are not rendered obvious in view of the cited art. Applicants therefore respectfully request the withdrawal of the 35 U.S.C. § 103(a) rejections of these claims.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance is requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 09-0458 maintained by Assignee.

Respectfully submitted,

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